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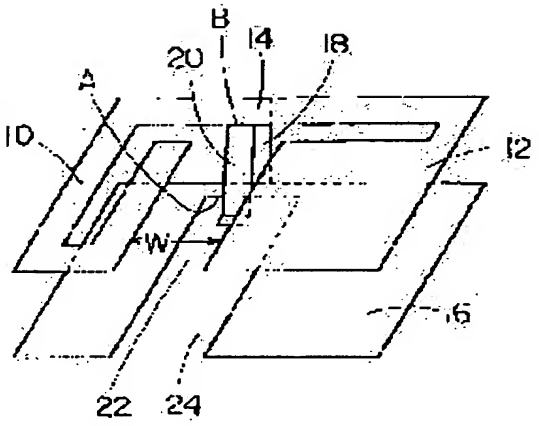
(54) TWO-FREQUENCY-BAND SHARED ANTENNA

(57)Abstract:
PROBLEM TO BE SOLVED: To obtain a two-frequency-band shared antenna that has less dispersion in electrical characteristics and high reliability by eliminating soldering parts.
SOLUTION: Two radiating conductor patterns 10, 12 each having a different resonance frequency, a grounding conductor pattern 16, a short-circuit conductor 18, and a feeding conductor 20 are formed out of a piece of a metal plate. The short-circuit conductor 18 is bent at the outside edge of a connection part 14 of the two radiating conductor patterns 10, 12, and further bent at the edge of the grounding conductor pattern 16 to short circuit the connection part 14 with the grounding conductor pattern 16. A cutout 22 of a width W wider than that of the feeding conductor 20 is provided between the radiating conductor patterns 10, 12. The feeding conductor 20 is formed in such a way that it is connected from the metal plate of the part corresponding to the cutout 22 to the connection part 14, and bent to the side of the grounding conductor pattern 16 at the inside edge of the connection part 14. Another cutout 24 is provided on the grounding conductor pattern 16 in such a way as to prevent the feeding conductor 20 bent to the side of the grounding conductor pattern from contacting the grounding conductor pattern 16.



LEGAL STATUS

[Date of request for examination]

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application converted registration]
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* NOTICES *

CLAIMS

[Claim(s)]
[Claim 1] It connects with a grounding conductor pattern (16) too hastily by the conductor (18). the following -- having -- a part of connection section (14) of the two aforementioned radiation conductor patterns (10 12) -- a short circuit -- In 2 frequency-band common antenna with which the conductor (20) is connected the short circuit of the aforementioned connection section (14) -- electric supply common to two radiation conductor patterns (10 12) in the position distant from the conductor (18) -- the two aforementioned radiation conductor patterns (10 12) and a short circuit -- a conductor (18) and electric supply -- so that the conductor (20) may be formed in one from the metal plate of one sheet and it may be located between the two aforementioned radiation conductor patterns and on the extension the aforementioned short circuit -- a conductor (18) forms successively on the edge of one side of the aforementioned connection section (14) -- having -- the aforementioned electric supply -- 2 frequency-band common antenna with which a conductor (20) is characterized by what are formed successively by the edge of other one side of the aforementioned connection section (14) Two radiation conductor patterns from which the resonance frequency connected mutually differs (10 12) The grounding conductor pattern arranged so that it may counter with these two radiation conductor patterns (16)
[Claim 2] The two aforementioned radiation conductor patterns (10 12), a grounding conductor pattern (16), a short circuit -- a conductor (18) and electric supply -- a conductor (20) forms in one from the metal plate of one sheet -- having -- **** -- the aforementioned short circuit -- a conductor (18) It is bent on the piece veranda of the aforementioned connection section (14), and is bent further at the marginal part of a grounding conductor pattern (16). The infeed (22) of latus width of face (W) is prepared from the width of face of a conductor (20). the aforementioned connection section (14) and a grounding conductor pattern (16) -- connecting too hastily -- **** -- between the two aforementioned radiation conductor patterns (10 12) -- the aforementioned electric supply -- A conductor (20) is formed in the form which leads to th aforementioned connection section (14) from the metal plate of this portion that cuts deeply and is equivalent to (22). the aforementioned electric supply -- It is bent on the other verandas of the aforementioned connection section (14) at the grounding conductor pattern (16) side. to the aforementioned grounding conductor pattern (16) the electric supply bent at the grounding conductor pattern side -- 2 frequency-band common antenna according to claim 1 characterized by what the notch (24) or opening (32) for making it a conductor (20) not contact a grounding conductor pattern (16) is prepared for
[Claim 3] it was formed in the grounding conductor pattern (16) -- cutting deeply -- the short circuit of (24) or opening (32) -- the edge (A) by the side of a conductor (18) -- from a radiation conductor pattern (10 12) side -- seeing -- electric supply -- the bending section (B) of a conductor (20) -- a short circuit -- 2 frequency-band common antenna according to claim 2 characterized by being located in conductor (18) approach

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[Translation done.]

* NOTICES *

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention is the antenna of the type called a reverse female mold antenna, and 1 / 4lambda antenna, and relates to the antenna of two frequency band common use.
[0002]
[Description of the Prior Art] Two radiation conductor patterns from which the resonance frequency with which 2 frequency-band common reverse female mold antenna of each other was connected differs, It has the grounding conductor pattern arranged so that it may counter with these two radiation conductor patterns. It connects with a grounding conductor pattern too hastily by the conductor. a part of connection section of the two aforementioned radiation conductor patterns -- a short circuit -- the aforementioned short circuit of the connection section of the two aforementioned radiation conductor patterns -- it has the composition that the electric supply pin common to two radiation conductor patterns was connected to the position distant from the conductor (a U.S. Pat. No. 5926139 specification, JP,10-93332,A)
[0003]
[Problem(s) to be Solved by the Invention] in order for such a 2 frequency-band common reverse female mold antenna to acquire the property stabilized in two frequency bands -- two radiation conductor patterns and short circuits -- it is required to keep exact physical relationship with a conductor and an electric supply pin However, since the conventional 2 frequency-band common reverse female mold antenna is structure which makes soldering connection of the electric supply pin at the connection section of two radiation conductor patterns, it becomes the factor which some position gap, the difference in a solder configuration, etc. may occur in the case of soldering, and this makes generate the variation in an electrical property. Moreover, conductivity is a low, the conductivity of a joint may change with junction states, and, as for solder, radiant efficiency may fall. A crack etc. may enter, a junction state may deteriorate and that there is furthermore the soldered joint section cannot say that it is enough in respect of reliability.
[0004] It is hard to generate the variation in an electrical property, and the purpose of this invention is to offer reliable 2 frequency-band common antenna.
[0005]
[Means for Solving the Problem] Two radiation conductor patterns from which the resonance frequency with which this invention was mutually connected in order to attain this purpose differs, It has the grounding conductor pattern arranged so that it may counter with these two radiation conductor patterns. It connects with a grounding conductor pattern too hastily by the conductor. a part of connection section of the two aforementioned radiation conductor patterns -- a short circuit -- In 2 frequency-band common antenna with which the conductor is connected the short circuit of the aforementioned connection section -- electric supply common to two radiation conductor patterns in the position distant from the conductor -- the two aforementioned radiation conductor patterns and a short circuit -- a conductor and electric supply -- so that the conductor may be formed in one from the metal plate of one sheet and it

may be located between the two aforementioned radiation conductor patterns and on the extension the aforementioned short circuit -- a conductor -- the edge of one side of the aforementioned connection section -- forming successively -- the aforementioned electric supply -- it is characterized by what conductors were formed successively for on the edge of other one side of the aforementioned connection section
[0006] Thus, if constituted, since grounding and electric supply can be performed in the connection section of two radiation conductor patterns, without using an electric supply pin, change of the property resulting from soldering of an electric supply pin is cancelable.
[0007] 2 frequency-band common antenna of this invention -- the two aforementioned radiation conductor patterns, a grounding conductor pattern, and a short circuit -- a conductor and electric supply -- a conductor forms in one from the metal plate of one sheet -- having -- **** -- the aforementioned short circuit -- a conductor It is bent on the piece veranda of the aforementioned connection section, and is bent further at the marginal part of a grounding conductor pattern. the aforementioned connection section and a grounding conductor pattern -- connecting too hastily -- **** -- between the two aforementioned radiation conductor patterns -- the aforementioned electric supply -- the infeed of latus width of face prepares from the width of face of a conductor -- having -- the aforementioned electric supply -- a conductor It is formed in the form which leads to the aforementioned connection section from the metal plate of the portion equivalent to this infeed, and is bent on the other verandas of the aforementioned connection section at the grounding conductor pattern side. to the aforementioned grounding conductor pattern the electric supply bent at the grounding conductor pattern side -- what the notch or opening for making it a conductor not contact a grounding conductor pattern is prepared for is desirable
[0008] If it is made such composition, since 2 frequency-band common antenna which has a grounding conductor pattern can be formed by appearance processing from the metal plate of one sheet, and folding and a soldering part can be abolished, it becomes possible to obtain 2 frequency-band common antenna with high reliability with little variation in an electrical property.

[0009] 2 frequency-band common antenna of this invention -- setting -- electric supply -- when bending a conductor to a grounding conductor pattern side on the edge of the connection section of a radiation conductor pattern, bending correctly in a regular position is important especially when abolishing the variation in a property for that purpose, the short circuit of the infeed or opening formed in the grounding conductor pattern -- a conductor -- a near edge -- from a radiation conductor pattern side -- seeing -- electric supply -- the bending section of a conductor -- a short circuit -- a conductor -- it is desirable that you make it located in approach thus -- if it carries out -- electric supply -- since it can bend in the folding position of a conductor from a grounding conductor pattern side and the receptacle type of business can b applied to it -- electric supply -- it becomes possible to perform folding of a conductor very correctly in a regular position
[0010]
[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained in detail with reference to a drawing.
[0011] [Operation gestalt 1] Drawing 1 is the perspective diagram showing 1 operation gestalt of 2 frequency-band common antenna concerning this invention. In drawing, the 1st radiation conductor pattern which has the configuration and size in which 10 resonates by the 1st frequency band, and 12 are the 2nd radiation conductor pattern which has the configuration and size which resonate by the 2nd frequency band, and there are these two radiation conductor patterns 10 and 12 in the same flat surface, and they are connected in the connection section 14. the grounding conductor pattern arranged so that 16 may maintain the aforementioned radiation conductor patterns 10 and 12 and a predetermined distance and it may counter, and the short circuit whose 18 short-circuits the connection section 14 of the radiation conductor patterns 10 and 12, and the grounding conductor pattern 16 -- the electric supply to which a conductor and 20 supply electric power to two radiation conductor patterns 10 and 12 in RF power from the aforementioned connection section 14 -- it is a conductor a short circuit -- a

conductor 18 and electric supply -- the conductor 20 is formed in the symmetric position on both sides of the connection section 14 moreover, a short circuit -- a conductor 18 and electric supply -- the conductor 20 is formed in the direction which intersects the connection section 14 to the direction where the radiation conductor patterns 10 and 12 were formed successively

[0012] Drawing 2 is the development having shown the state in front of folding of the antenna of drawing 1 . Namely, appearance processing of the metal plate of one sheet is carried out (stamping, clipping processing, etching processing, etc.), and the antenna of drawing 1 forms a pattern like drawing 2 , and forms it by carrying out folding of this. if it furthermore explains in full detail -- a short circuit -- the conductor 18 was formed of appearance processing so that the rim and the grounding conductor pattern 16 of the connection section 14 might be connected, it was bent on the edge of the outside of the connection section 14, was further bent on the edge of the grounding conductor pattern 16, and has short-circuited the connection section 14 and the grounding conductor pattern 16

[0013] moreover -- between two radiation conductor patterns 10 and 12 -- electric supply -- the infeed 22 of the latus width of face W prepares from the width of face of a conductor 20 -- having -- electric supply -- a conductor 20 is formed in the form which leads to the aforementioned connection section 14 from the metal plate of the portion equivalent to this infeed 22, and is bent on the edge inside the connection section 14 at the grounding conductor pattern 16 side the electric supply furthermore bent by the grounding conductor pattern 16 at the grounding conductor pattern 16 side -- the notch 24 for making it a conductor 20 not contact the grounding conductor pattern 16 is formed

[0014] 2 frequency-band common antenna constituted as mentioned above -- the radiation conductor patterns 10 and 12, the grounding conductor pattern 16, and a short circuit -- a conductor 18 and electric supply -- since a conductor 20 is formed of appearance processing from the metal plate of one sheet, and folding and there is no soldering section, the configuration of each part and physical relationship can be uniformly finished in a high precision Therefore, 2 frequency-band common antenna with little variation in an electrical property by which quality was stabilized can be obtained. Moreover, since there is no soldering process, it excels also in productivity.

[0015] the short circuit of a notch 24 to which the antenna of drawing 1 was formed in the grounding conductor pattern 16 when furthermore explained in full detail -- the edge A by the side of a conductor 18 -- from the radiation conductor pattern 10 side and 12 sides -- seeing -- electric supply -- the bending section B of a conductor 20 -- a short circuit -- a conductor -- you make it located in 18 approach If the development of drawing 2 explains, width of face D of the portion which is equivalent to the connection section 14 of the grounding conductor pattern 16 from the width of face C of the connection section 14 is made small. thus, when it carries out, it is shown in drawing 3 -- as -- a short circuit -- the electric supply after bending the both ends of a conductor 18 right-angled and making parallel the radiation conductor patterns 10 and 12 and the grounding conductor pattern 14 -- the time of bending a conductor 20 -- electric supply -- since folding by the bending die 28 is made where it received in the folding position of a conductor 20 from the grounding conductor pattern 16 side and a mold 26 is applied to it -- electric supply -- folding of a conductor 20 can be performed very correctly in for this reason, electric supply -- a conductor 20, and the radiation conductor patterns 10 and 12 and a short circuit -- physical relationship (dimensional accuracy) with a conductor 18 can be finished very correctly, and 2 frequency-band common reverse female mold antenna with more little variation in a property can be obtained

[0016] in addition, electric supply -- in order to perform folding of a conductor correctly, it is shown in drawing 4 -- as -- between the connection section 14 and the grounding conductor patterns 16 -- a short circuit -- after carrying out restoration fabrication of the resin 30 so that a conductor 18 may be met, you may be made to perform folding by the bending die 28 in this case, the short circuit of the notch 24 formed in the grounding conductor pattern 16 -- the edge A by the side of a conductor 18 -- from the radiation conductor pattern 10 side and 12 sides -- seeing -- electric supply -- you may be in the same position as the bending section B of a conductor 20

[0017] [Operation gestalt 2] Drawing 5 shows other operation gestalten of this invention. the electric supply by which this 2 frequency-band common antenna was bent at the grounding conductor pattern 16 side -- in order to make it a conductor 20 not contact the grounding conductor pattern 16, opening 32 is formed in the grounding conductor pattern 16 Since the other composition is the same as the antenna of the operation gestalt 1, the same sign is given to the same portion and explanation is omitted. The effect as the operation gestalt 1 that such composition is also the same can be acquired.
[0018] [Operation gestalt 3] Drawing 6 shows the operation gestalt of further others of this invention. The development in front of folding of the metal plate with which appearance processing of the (A) was carried out, (B), and (C) are the plans of 2 frequency-band common reverse female mold antenna formed from the metal plate of (A), respectively. The pattern of (A) is formed in the state where the portion of the infeed 22 between two radiation conductor patterns 10 and 12 was connected by the grid-like pattern 36 which has many holes 34. Since it is the same as that of the pattern of drawing 2 except it, the same sign has been given to the same portion.
[0019] if it is made such a pattern -- a short circuit -- what bent the both ends of a conductor 18 and was made into the shape of a KO character -- the metal mold for resin fabrication -- when setting inside and carrying out restoration fabrication of the resin between the radiation conductor patterns 10 and 12 and the grounding conductor pattern 16, the position of release one end of the radiation conductor patterns 10 and 12 is stabilized, and resin fabrication can be performed correctly moreover, after fabrication -- electric supply -- the time of clipping a conductor 20 -- (B) -- like -- electric supply -- a conductor 20 can also be clipped in the shape of a straight line, and as shown in (C), it can also clip in the shape of meandering if it clips in the shape of meandering as shown in (C) -- electric supply -- the same state as having inserted the loading coil in the conductor 20 is acquired therefore, electric supply -- gap of the resonance frequency according to the influence of a case etc. by changing the clipping path of a conductor 20 -- an amendment -- things are made
[0020] in addition -- although this operation gestalt showed the antenna of the type called a reverse female mold -- a short circuit -- naturally it comes out that the width of face of a conductor can produce similarly the antenna of the type called latus 1/4lambda type
[0021] [Operation form 4] Drawing 7 and drawing 8 show the operation form of further others of this invention. the point that this antenna differs from the antenna of drawing 1 -- a metal plate -- appearance processing -- carrying out -- the radiation conductor patterns 10 and 12, the connection section 14, and a short circuit -- a conductor 18 and electric supply -- it is in the point that formed the conductor 20 in one and these formed the grounding conductor pattern 16 independently
[0022] a short circuit -- as shown in drawing 8 , the electric connection between a conductor 18 and the grounding conductor pattern 16 forms a land 42 in the circuit board 40 in which an antenna is installed, as a two-dot chain line shows, and is performed through this
[0023] such an antenna -- the metal plate of one sheet to appearance processing -- the radiation conductor patterns 10 and 12 and a short circuit -- a conductor 18 and electric supply -- since the conductor 20 was formed in one, it is not necessary to solder an electric supply pin for electric supply, and the variation in the property resulting from soldering can be reduced
[0024] in addition -- this antenna -- electric supply -- a conductor 20 -- between the radiation conductor patterns 10 and 12 -- arranging -- this and confrontation -- a short circuit -- although the conductor 18 has been arranged -- electric supply -- a conductor 20 and a short circuit -- you may arrange a conductor 18 conversely thus, electric supply -- a conductor 20 and a short circuit -- in arranging a conductor 18 conversely, naturally according to this, it also adjusts the land 41 of the circuit board 40
[0025]
[Effect of the Invention] Since a soldering part can be reduced according to this invention as explained above, 2 frequency-band common antenna with high reliability with little variation in an electrical property can be obtained.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The perspective diagram showing 1 operation gestalt of 2 frequency-band common antenna concerning this invention.
[Drawing 2] The development of the antenna of drawing 1 .
[Drawing 3] electric supply in process in which the antenna of drawing 1 is manufactured -- the perspective diagram showing how to bend a conductor
[Drawing 4] the same -- electric supply -- the perspective diagram showing other examples of how to bend a conductor
[Drawing 5] The perspective diagram showing other operation gestalten of 2 frequency-band common antenna concerning this invention.
[Drawing 6] For (A), the development showing the operation gestalt of further others of this invention, (B), and (C) are the plan showing 2 frequency-band common reverse female mold antenna manufactured from the expansion pattern of (A), respectively.
[Drawing 7] The development showing the operation gestalt of further others of this invention.
[Drawing 8] The perspective diagram showing 2 frequency-band common antenna formed from the expansion pattern of drawing 7 .
[Description of Notations]
10: The 1st radiation conductor pattern which resonates by the 1st frequency band
12: The 2nd radiation conductor pattern which resonates by the 2nd frequency band
14: Connection section
16: Grounding conductor pattern
18: a short circuit -- a conductor
20: electric supply -- a conductor
22: Infeed
24: Notch
32: Opening

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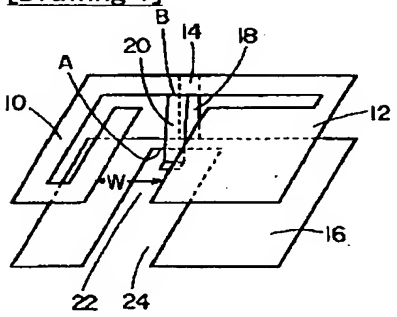
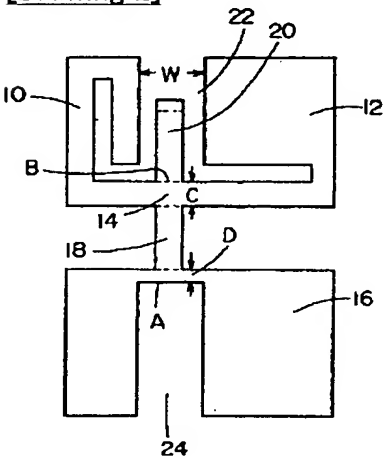
* NOTICES *

DRAWINGS

[Drawing 1]



[Drawing 2]



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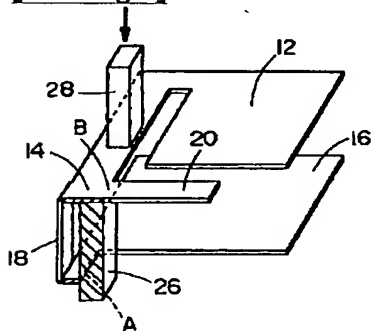

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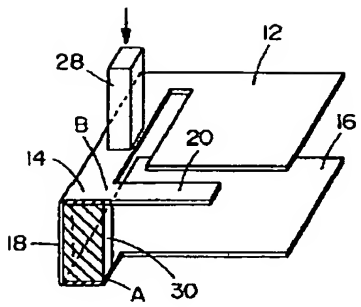

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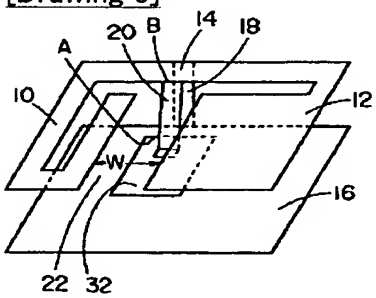
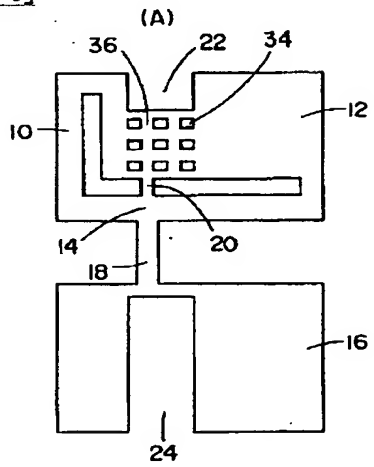
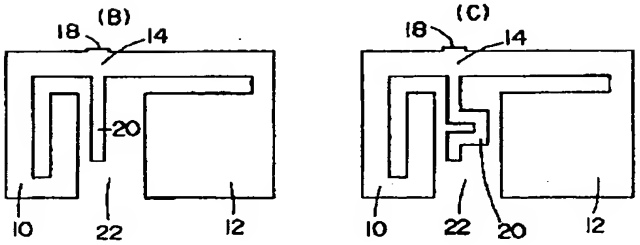


[Drawing 6]





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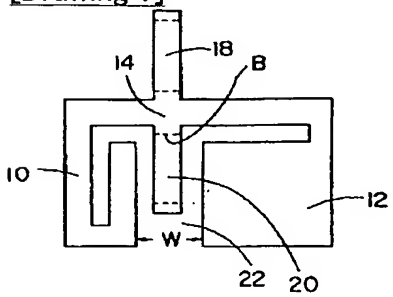
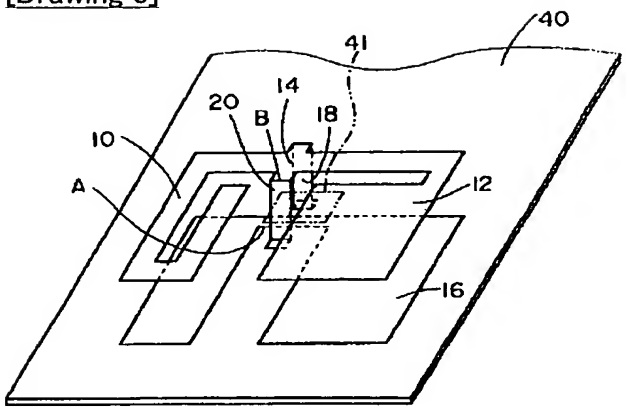


[Drawing 8]



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